IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION FOR LETTERS PATENT

INVENTOR:

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TITLE:

A System and Method for Scheduled Events to Subscribe to Live Information Topics

BACKGROUND OF THE INVENTION

Field of Invention

The present invention relates generally to the field of electronic calendar systems. More specifically, the present invention is related to accessing dynamic content linked to different calendar

5   events.

Discussion of Prior Art

In traditional electronic scheduling or calendaring systems, entries are static. They are entered by a calendar user as a reminder for a future event and, perhaps, an accompanying alarm is set as well. Recently, it has been recognized that it would be useful for a calendar system to automatically retrieve additional information related to the scheduled events or entries. Examples of additional information that can be automatically collected and tied to a calendar entries include information about meeting participants, flight itineraries, driving instructions, and weather forecasts. While this general concept has previously been identified, the prior art fails to provide details regarding how to implement the capability of linking calendar events and related dynamic information. The following two patents provide an introduction to electronic calendaring systems and locating additional information relevant to a calendar entry.

The patent to Borovoy et al. (5,842,009) provides for a system which automatically retrieves documents relevant to a user's calendar event. This reference focuses on determining when to

20   retrieve information and how to determine what information might be most relevant.

The patent to Rasansky et al. (5,960,406) provides for a computerized calendar and

scheduling system which allows access to web-based clients. However, no teaching of dynamic content delivery is provided.

Whatever the precise merits and features of the prior art in this field, the earlier art does not achieve or fulfill the purposes of the present invention. The prior art does not provide for sharing

5   and linking additional information among multiple calendar events and multiple calendar users; nor does it provide methods for updating and refreshing dynamic information.

SUMMARY OF THE INVENTION

A calendar system stores and organizes materials related to scheduled events, to-dos,

10   addresses, etc. and allows a user to browse a calendar and select entries for viewing. In addition, each entry is linked to any number of topics related to that entry and up-to-date information on these topics are displayed when the entry is viewed. Topics are published on topic channels by one or more topic providers and a calendar system administrator defines which topics relate to which

15   calendar entries. When a client enters information related to a new calendar entry or event, the calendar system determines which topics relate to that event and identifies corresponding topic channels which currently exist, or need to be created, between the calendar system and the topic providers. Finally, in each calendar entry, links are created to local versions of the appropriate topic channels and the entry is then persistently stored. Multiple calendar events and multiple calendar

20   users are able to link to the same local topic channel and thereby reduce data searching, retrieval, and storage costs.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates the overall architecture of a calendar systems according to the present invention.

Figure 2 illustrates a flowchart of a method of linking a topic channel to a new calendar event

5   according to the present invention.

Figure 3 illustrates a flowchart of a method of removing a topic channel according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

10   While this invention is illustrated and described in a preferred embodiment, the invention may be produced in many different configurations, forms and materials. There is depicted in the drawings, and will herein be described in detail, a preferred embodiment of the invention, with the understanding that the present disclosure is to be considered as a exemplification of the principles of the invention and the associated functional specifications of the materials for its construction and

15   is not intended to limit the invention to the embodiment illustrated. Those skilled in the art will envision many other possible variations within the scope of the present invention.

The following definitions may assist in understanding terminology used throughout the present specification:

Service: Services gather information, organize the information into topics and publish the

20   information periodically to update its subscribers. Services are typically distributed across a number of separate servers across multiple networks.

Service Parameters: Service parameters control things such as refresh rates for individual topics, information retrieval control parameters, etc.

Topic: A topic is a node in a topic tree. Topic names are hierarchical. For example, a weather service has two topics "Weather/San Jose" and "Weather/Boston". A subscriber can

5   subscribe to any of these two topics; meaning the subscriber retrieves weather forecasts from both San Jose and Boston. The subscriber can also subscribe to the root topic, "Weather".

Topic Channel: A topic channel is used to pass messages from a topic publisher to a topic subscriber. Sun's™ Java Messaging Service Interface is one standard for setting up publisher/subscriber infrastructures across networks. Microsoft's™ Channel Definition Format

10   (CDF) is a specification regarding how web publishers can offer frequently updated collections of information to interested subscribers.

Figure 1 depicts the logical components of the present invention along with their interconnections. The principles and operation of the present invention are provided by discussing the flow of information between these logical components. Calendar Server **100** is illustrated as a

15   single entity; however, the present invention also contemplates the logical components of server **100** distributed across networked systems.

Calendar Server **100** handles request **120** from a client (not shown) and, in response, creates new calendar event (or entry, throughout the specification these terms are used interchangeably) **108**. In particular, Request Handler **102** receives request **120** for a new event **108** to be scheduled and

20   begins processing it. Request Handler **102** first passes new event **108** to Topic Selector **104**.

Topic Selector **104** receives new event **108** and retrieves from Topic Binding Repository **106**

all the services which are associated with new event **108**. Specifically, Topic Selector **104** extracts relevant information from new event **108** and forwards it to Repository **106** which then maps the event's category (e.g. meeting, travel, vacation etc.) and the event's properties (e.g. departure location, destination, date, etc.) to a number of corresponding services. Repository **106** and its

5   mappings are typically set up by a calendar administrator; however, the present invention also contemplates within its scope custom editing of Repository **106** entries by clients. As an example, when a client schedules a business trip to Boston, MA in their calendar, Topic Selector **104** looks in Topic Binding Repository **106** under the business trip category and finds (for example) mapping entries identifying two services: "Weather" and "FlightSchedules". Further, Topic Selector **104**

10   extracts, from new event **108**, the destination for this business trip which results in the construction of two topic names: "Weather/MA/Boston" and "FlightSchedules/SJC/Boston". Many additional topic names and services are contemplated within the scope of the present invention.

The list of topic names generated from Topic Binding Repository **106** is passed to Topic Finder **110** which returns a list of Topic Channels **114a, 114b** and **114c**. In particular, Topic Finder

15   **110** takes the list of topic names and, for each name, checks whether there is an existing Topic Channel already set-up. If there is, then this existing Topic Channel is used. If not, then a new Topic Channel must be created for new event **108**. To create a new Topic Channel, Topic Finder **110** instructs Topic Creator **112** to create an appropriate, new Topic Channel for new event **108**.

Topic Creator **112** receives one or more topic names (e.g. Weather/AZ/Tucson) from Topic

20   Finder **110** and sends a request to an administrator **160** of a remote Topic Provider **150** to create a new Topic **156a, 156b** and **156c** and Topic Channel **158a, 158b** and **158c** for a given topic name.

Upon successful creation, Topic Creator **112** creates corresponding local Topic Channel(s) **114a, 114b** and **114c**, which are also linked to remote Topic Channels **158a, 158b** and **158c**, and returns these channel names to Topic Finder **110**. Remote Topic Provider(s) **150** and their administrator(s) **160** control, using known methods, how services **154a** and **154b**, Topics **156a, 156b** and **156c**, and

5   Topic Channels **158a, 158b** and **158c** are internally managed and arranged. While depicted as a homogeneous block in figure 1, multiple and distributed Topic Providers **150** are also considered within the scope of the present invention.

Topic Finder **110** receives from Topic Creator **112** a list of topic channels (existing or newly created) corresponding to new event **108** and forwards this list to Topic Selector **104** which then

10   passes the list to Request Handler **102**.

Request Handler **102** continues processing new event **108** by adding a link in new event **108** to each Topic Channel **114a, 114b** and **114c** received from Topic Selector **104**. Finally, Request Handler **102** stores new event **108** in a persistent calendar store (not shown) in order to allow retrieval at a later time.

15   In the event that a client requests deletion of a scheduled event, Request Handler **102** first removes all the links to the event's Topic Channels and then proceeds to erase the event from the persistent calendar store.

Figure 2 depicts a flowchart of the logic of creating links to topic channels in new events. This figure focuses on the flow of the logic without explicit references to the components performing

20   the steps.

First, a new event is retrieved in step **202**. Next, in step **204**, topic names are determined which correspond to this type of event and to the data characterizing this event. These topic names

are individually looped through, in step **206,** to determine if a corresponding Topic Channel exists (step **208**) or needs to be created (step **210**). In step **212,** a list of corresponding Topic Channels is constructed and step **214** loops back around to ensure all topic names have been analyzed. Processing continues, in step **216,** by linking the identified Topic Channels to the new event. After

5   storing the new event in any type of well-known computer storage media, in step **218,** processing finishes in step **220.**

Figure 3 illustrates the logical flow of removing a subscriber from a topic. In step **302,** the link from an event to a topic is deleted and step **304** tests whether there are any other links to the particular topic. If there are, then the flow ends in step **308.** If there are no other links, however, the

10   topic is deleted in step **306** and then flow completes with step **308.**

The present invention allows calendar events to subscribe to specific topics that are relevant to that particular event. Relevant topics include weather forecasts, flight schedules, traffic reports, local news stories and other information. Information is published by an information service and retrieved by one or more information subscribers. Using the infrastructure of the present invention,

15   multiple calendar events are able to share the same information by having each separate event, which relies on similar live information, link to the same local Topic Channel. For example, if two calendar users are traveling to New York on the same day, both events are linked to information retrieved from the New York weather topic and New York local news topic. The present invention relieves the need to repeatedly search, retrieve and store additional information for every single

20   calendar event scheduled. These performance improvements are true for different calendar events belonging to a single user as well as separate calendar events belonging to different users.

CONCLUSION

A system and method has been shown in the above embodiments for the effective implementation of linking electronic calendar events to related, dynamic information by subscribing the events to live information topics. While various preferred embodiments have been shown and

5   described, it will be understood that there is no intent to limit the invention by such disclosure, but rather, it is intended to cover all modifications and alternate constructions falling within the spirit and scope of the invention and as further defined in the appended claims. For example, the present invention should not be limited by calendaring software/program, computing environment, specific computing hardware, specific information service providers, particular publication/subscription

10 hierarchies, specific enterprise messaging interfaces, particular push-content technologies and specific distributed arrangement of the system's functional components. In addition, the present invention may be implemented on a conventional IBM PC or equivalent, multi-nodal system (e.g. LAN), across extended networks such as the Internet or using portable equipment such as laptop computers or wireless equipment (RF, microwaves, infrared, photonics, etc.).